418. We conclude that customized routing, which permits requesting carriers to designate the particular outgoing trunks that will carry certain classes of traffic originating from the competing provider's customers, is technically feasible in many LEC switches. Customized routing will enable a competitor to direct particular classes of calls to particular outgoing trunks, which will permit a new entrant to self-provide, or select among other providers of, interoffice facilities, operator services, and directory assistance.[927] Bell Atlantic notes that customized routing is generally technically feasible for local calling, although it notes that the technology and capacity constraints vary from switch to switch.[928] SBC contends that customized routing is technically infeasible for older switches, such as the 1AESS switch.[929] AT&T acknowledges that, although the ability to establish customized routing in 1AESS switches may be affected by the "call load" in each office, only 9.8% of the switches used by the seven RBOCs, GTE and SNET are 1AESS switches.[930] We recognize that the ability of an incumbent LEC to provide customized routing to a requesting carrier will depend on the capability of the particular switch in question. Thus, our requirement that incumbent LECs provide customized routing as part of the "functionality" of the local switching element applies, by definition, only to those switches that are capable of performing customized routing. An incumbent LEC must prove to the state commission that customized routing in a particular switch is not technically feasible.

419. Section 251(d)(2)(A) requires the Commission, in determining which network elements should be made available to competing providers, to consider "whether access to such network elements as are proprietary in nature is necessary."[931] To withhold a proposed network element from a competing provider, an incumbent LEC must demonstrate that the element is proprietary and that gaining access to that element is not necessary because the competing provider can use other, nonproprietary elements in the incumbent LEC's network to provide service.[932] U S West asserts that switch unbundling could raise concerns involving, among other things, "licensing of intellectual property." It cites a request by one interconnector to be the

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[927] *See, e.g.*, AT&T June 28 *Ex Parte*. In addition, we note that the Illinois Commission recently directed Ameritech and Centel to permit a carrier purchasing wholesale local exchange service to designate a provider of operator services and directory assistance other than that of the incumbent LEC. Such access is accomplished through the routing of such calls from the incumbent LEC's switch to the competing provider of the operator service or directory assistance. *See Illinois Wholesale Order* at 45.

[928] Letter from Patricia Koch, Assistant Vice President, Bell Atlantic, to William Caton, Acting Secretary, FCC, June 24, 1996 (Bell Atlantic June 24 *Ex Parte*); *see also* BellSouth comments at 41-42 n.89 (the ability to provide customized routing depends on the quantity of customized routing requests from other competitors).

[929] SBC comments at 41-42.

[930] Letter from Bruce Cox, Government Affairs Director, AT&T, to William F. Caton, Secretary, FCC, July 11, 1996 (AT&T July 11 *Ex Parte*).

[931] 47 U.S.C. § 251(d)(2)(A).

[932] *See supra* Section V.E.

exclusive provider of particular features in U S West's generic switching software.[933] Bell Atlantic states that it is not at liberty to sub-license the software that operates vertical switching features.[934] We note, however, that these incumbent LECs do not object to providing vertical switching functionalities to requesting carriers under the resale provision of section 251(c)(4).[935] In addition, the vast majority of parties that discuss unbundled local switching do not raise proprietary concerns with the unbundling of either basic local switching or vertical switching features. Even if we accept the claim of U S West and Bell Atlantic that vertical features are proprietary in nature, these carriers do not meet the second consideration in our section 251(d)(2)(A) standard, which requires an incumbent LEC to show that a new entrant could offer the proposed telecommunications service through the use of other, nonproprietary elements in the incumbent LEC's network.[936] Accordingly, we find that access to unbundled local switching is clearly "necessary" under our interpretation of section 251(d)(2)(A).[937]

420. Section 251(d)(2)(B) directs the Commission to consider whether the failure to provide access to an unbundled element "would impair the ability of the telecommunications carrier seeking access to provide the services that it seeks to offer."[938] We have interpreted the term "impair" to mean either increased cost or decreased service quality that would result from using network elements of the incumbent LEC other than the one sought.[939] SBC and MFS contend that access to unbundled local switching may not be essential for new entrants because competitors are likely to deploy their own switches.[940] These parties present no evidence that competitors could provide service using another element in the LEC's network at the same cost and at the same level of quality. In addition, most commenters that address this issue generally argue that local switching is essential for the provision of competing local service,[941] and we agree. We thus conclude that a requesting carrier's ability to offer local exchange services would be impaired, if not thwarted, without access to an unbundled local switching element.

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[933] U S West comments at 55 n.117.

[934] Bell Atlantic comments, Albers Attachment at 17-18.

[935] U S West reply at 26-27; Bell Atlantic comments at 26.

[936] *See supra* Section V.E.

[937] *Id.*

[938] 47 U.S.C. § 251(d)(2)(B).

[939] *See supra* Section V.E.

[940] SBC reply at 23; MFS comments at 46.

[941] *See, e.g.*, LDDS reply at 18 (unbundled local switching is "critical" to local competition); TIA comments at 18; AT&T Mar. 21 Letter at 17-18.

421. Section 251(c)(3) requires that incumbent LECs provide access to unbundled network elements on terms and conditions that are "just, reasonable, and nondiscriminatory."[942] We agree with CompTel and LDDS that new entrants will be disadvantaged if customer switchover is not rapid and transparent. We also note that the Michigan Commission has recognized the significance of customer switchover intervals and has directed Ameritech and GTE to file proposals on how they will "ensure the equal availability of expeditious processing of local, interLATA, and intraLATA carrier changes."[943] Therefore, we require incumbent LECs to switch over customers for local service in the same interval as LECs currently switch end users between interexchange carriers. This requirement applies to switchovers that only require the incumbent LEC to make changes to software. Switchovers that require the incumbent LEC to make physical modifications to its network, such as connecting a competitor's loop to its switch, are not subject to this requirement, and instead are governed by our terms and conditions for all unbundled elements.[944] Today, incumbent LECs routinely change customers' presubscribed interexchange carriers quickly and transparently, thereby contributing to the competitiveness of the interexchange market. We expect that a similar requirement for local exchange switchovers that require only a software change will similarly contribute to local exchange competition.

422. We reject the proposal by some incumbent LECs to define unbundled local switching as the facilities that provide a *point of access* to the switch, but that would not actually include switching functionality. Under this definition, the purchaser of the local switching element would not actually obtain local switching, only the right to purchase local switching functionality and other switching features at wholesale rates. We believe that the unbundled local switching element must include the functionality of connecting lines and trunks. The definition proposed by these incumbent LECs would contravene the requirement in section 251(c)(3) that incumbent LECs provide network elements "in a manner that allows requesting carriers to combine such elements in order to provide such telecommunications service."[945] If a competing provider combined its own loops and transport with the local switching element ("point of access"), it would be unable to provide telecommunications service without separately purchasing, at wholesale rates, switching functionality from the incumbent LEC.

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[942] 47 U.S.C. § 251(c)(3).

[943] *In the Matter, On the Commission's Own Motion, To Establish Permanent Interconnection Arrangements Between Basic Local Exchange Service Providers*, Opinion and Order, Mich. Pub. Serv. Comm'n, Case No. U-10860, at 36-37 (June 5, 1996).

[944] *See supra* Section V.G., discussing provisioning intervals for unbundled network elements.

[945] 47 U.S.C. § 251(c)(3).

423. We also disagree with the proposal to define local switching as a point of access plus basic switching functionality, but that would exclude vertical switching features.[946] As a legal matter, this definition is inconsistent with the 1996 Act's definition of "network element," which includes all the "features, functionalities, and capabilities provided by means of such facility or equipment."[947] In addition, this definition would not fulfill the pro-competitive objectives of the 1996 Act as effectively as the per-line definition we adopt. A competitor that obtains basic and vertical switching features at cost-based rates will have maximum flexibility to distinguish its offerings from those of the incumbent LEC by developing a variety of service packages and pricing plans.[948] Moreover, an upfront purchase of all local switching features may speed entry by simplifying practical issues such as the pricing of individual switching features.

424. We also address the impact on small incumbent LECs. For example, the Illinois Independent Telephone Association and the Rural Telephone Coalition favor rules that recognize the differences between larger and smaller LECs.[949] We have considered the economic impact of our rules in this section on small incumbent LECs. In this section, for example, we expressly provide for the fact that certain LECs may possess switches that are incapable of performing customized routing for competitors that purchase unbundled local switching. As noted by Rural Telephone Coalition and the Illinois Independent Telephone Coalition, this approach is necessary to accommodate the different technical capabilities of large and small carriers. We also note that section 251(f) of the 1996 Act provides relief for certain small LECs from our regulations under section 251.

(2) Tandem Switching Capability

425. We also affirm our tentative conclusion in the NPRM that it is technically feasible for incumbent LECs to provide access to their tandem switches unbundled from interoffice transmission facilities. We note that some states already have required incumbent LECs to unbundle tandem switching.[950] Parties do not contend, pursuant to section 251(d)(2)(A), that tandem switches are proprietary in nature. With regard to section 251(d)(2)(B), we find that competitors' ability to provide telecommunications service would be impaired without unbundled access to tandem switching. Therefore, we find that the availability of unbundled tandem

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[946] Sprint comments at 34; USTA reply at 16-17; SBC reply at 20; NYNEX reply at 31; MECA comments at 29.

[947] 47 U.S.C. § 153(29); *see supra* section V.C., which interprets the Act's definition of "network element."

[948] *See, e.g.*, LDDS comments at 33; AT&T comments at 21.

[949] Illinois Ind. Tel. Ass'n comments at 1; Rural Tel. Coalition reply at 37.

[950] *See, e.g.*, Ameritech comments at 43, Cincinnati Bell comments at 18, GTE comments at 38, AT&T March 21 Letter at 23.

switching will ensure that competitors can deploy their own interoffice facilities and connect them to incumbent LECs' tandem switches where it is efficient to do so.

426. We define the tandem switch element as including the facilities connecting the trunk distribution frames to the switch, and all the functions of the switch itself, including those facilities that establish a temporary transmission path between two other switches. The definition of the tandem switching element also includes the functions that are centralized in tandems rather than in separate end office switches, such as call recording, the routing of calls to operator services, and signaling conversion functions.

(3) Packet Switching Capability

427. At this time, we decline to find, as requested by AT&T and MCI, that incumbent LECs' packet switches should be identified as network elements. Because so few parties commented on the packet switches in connection with section 251(c)(3), the record is insufficient for us to decide whether packet switches should be defined as a separate network element. We will continue to review and revise our rules, but at present, we do not adopt a national rule for the unbundling of packet switches.

3. Interoffice Transmission Facilities

a. Background

428. In the NPRM, we proposed to require incumbent LECs to make available unbundled transport facilities in a manner that corresponds to the rate structure for interstate transport charges. We specifically proposed to require unbundled access to links between the end office and the serving wire center (SWC), the SWC and the IXC point of presence (POP), the end office and the tandem switch, and the tandem switch and the SWC. We also tentatively concluded that incumbent LECs should be required to unbundle channel termination facilities for special access from the interoffice facilities. In addition, we requested comment on whether and how other interoffice facilities used by incumbent LECs should be unbundled.

b. Comments

429. The vast majority of the parties that discussed local transport unbundling supported the Commission's proposal to provide access to dedicated and shared interoffice facilities as unbundled network elements.[951] BellSouth, for example, asserts that individual transport

[951] AT&T comments at 22; USTA comments at 35; Frontier comments at 16; GCI comments at 12; Sprint comments at 39; GST comments at 24; NYNEX comments at 63; NEXTLINK comments at 23; ACSI comments at 41; MCI comments at 17; ALTS comments at 30; Citizens Utilities comments at 15; CompTel comments at 45; TIA comments at 13; Bell Atlantic comments at 22; U S West comments at 48; Teleport comments at 37; MFS

components should be available as unbundled elements, and notes that some LECs already have unbundled transport from its other access services.[952]

430. Several incumbent LECs contend that they already provide unbundled transport services pursuant to the Commission's *Expanded Interconnection* rules.[953] PacTel asserts that its proposal to tariff unbundled transport elements, including dedicated transport and tandem-switched transport, will fulfill its duties under sections 251 and 271.[954] Bell Atlantic and TIA, on the other hand, indicate that existing tariffs for unbundled transport facilities are insufficient to comply with the 1996 Act.[955] MFS asks the Commission to clarify that, under the expanded interconnection rules as well as the 1996 Act, incumbent LECs must unbundle all interoffice transport facilities without requiring the requesting carrier to purchase channel terminations or other elements.[956]

431. Parties agree that local transport unbundling is technically feasible.[957] MCI, for example, asserts that transport facilities are already unbundled for exchange access and thus there is no question that unbundling is technically feasible.[958] NCTA, GST, TIA, and MFS contend that unbundling transport elements should be presumed technically feasible because of the Commission's *Expanded Interconnection* proceeding.[959] AT&T and Telecommunications Resellers Association point out that IXCs currently obtain interconnections between transport elements and the tandem switches pursuant to standard specifications.[960]

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comments at 48; USTA comments at 35; TCC comments at 35; New York Commission comments at 27; Ameritech comments at 43; BellSouth comments at 42.

[952] BellSouth comments at 42-43.

[953] Ameritech comments at 42-43; Cincinnati Bell comments at 18; GTE comments at 38.

[954] PacTel comments at 57.

[955] Bell Atlantic comments at 27 (Bell Atlantic has already filed, or plans to file, intrastate tariffs for the network elements it has unbundled under expanded interconnection.); TIA comments at 13.

[956] MFS comments at 48; *accord* AT&T comments at 22; MCI comments at 17.

[957] *See, e.g.*, GST comments at 24; AT&T comments at 22; GTE reply at 18-19; GVNW comments at 28; NYNEX comments at 65; MCI comments at 32; Comcast comments at 18; CompTel comments at 31; NCTA comments at 42; MFS comments at 48; Telecommunications Resellers Ass'n comments at 35; Ameritech comments at 43.

[958] MCI comments at 32.

[959] NCTA comments at 42; GST comments at 24; TIA comments at 13; MFS comments at 47-48.

[960] AT&T comments at 22; Telecommunications Resellers Ass'n comments at 35.

432. A number of commenters specify particular components of local transport that should be unbundled: (1) dedicated transport trunks from incumbent LEC end offices to competitors' switches, to IXC POPs, and to other end offices of the incumbent LEC; and (2) common transport trunks between incumbent LEC end offices and tandem switches.[961] In addition, ALTS, MFS, AT&T, and MCI contend that requesting carriers should have the ability to order such transport trunks with or without electronics (*i.e.*, as "dark fiber").[962] GTE disagrees and argues that the definition of network element only encompasses facilities "*used* in the provision of telecommunications service," and that dark fiber does not meet this definition because LECs do not "use" it in their networks.[963]

433. Several parties ask that the Commission specify additional transport components as unbundled network elements beyond those proposed in the NPRM. AT&T contends that incumbent LECs should have to unbundle their digital cross-connect systems (DCSs), which are now used to disaggregate high-speed traffic from IXCs into individual circuits.[964] MCI and AT&T contend that these facilities will enable IXCs to use more cost-efficient, high-speed facilities to route traffic to the incumbent LEC and have the traffic disaggregated into individual circuits at the DCS.[965] CompTel asserts that, when direct-trunked transport transits a tandem switch or other intermediate node, incumbent LECs should offer each individual link as an unbundled element.[966] MCI also asserts that competitors need "loop transport" to carry traffic from the incumbent's unbundled loops to the competitor's switch.[967]

434. A number of parties assert that the availability of unbundled transport facilities would promote local competition. AT&T contends that it seeks to combine unbundled common transport with competitive tandem switching and dedicated transport to provide IXCs with alternative access service from the competitor's end office to the IXC POP.[968] AT&T, Telecommunications Resellers Association, and TIA assert that the availability of unbundled

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[961] *See, e.g.*, AT&T comments at 22; NYNEX comments at 62-63; GVNW comments at 20; TCC reply at 18; ACSI comments, Attachment 1 at 5-6.

[962] ALTS comments at 30; MCI comments at 32; AT&T comments at 22; MFS comments at 48.

[963] GTE reply at 21.

[964] AT&T comments at 22 n.23; *accord* SBC comments at 87.

[965] AT&T comments at 22; MCI comments at 17.

[966] CompTel comments at 45.

[967] MCI comments at 22.

[968] AT&T Mar. 21 Letter at 22.

dedicated transport will allow competitors to connect their switches to incumbent LEC switches efficiently.[969] MCI contends that incumbent LECs have denied MCI access to trunks between the incumbent LECs' end offices, thereby increasing MCI's costs of deploying local facilities and restricting MCI's ability to acquire redundant facilities for its local traffic.[970] NYNEX and LDDS recommend that the Commission require incumbent LECs to offer unbundled dedicated transport between their own end office or tandem switches and the requesting carrier's switch or POP.[971] The Texas Public Utility Commission has specifically required incumbent LECs to provide competitors with "loop facilities transport service," which connects an unbundled loop to the competitor's switch.[972]

435. Several parties caution that pricing distortions could accompany a ruling that transport components are network elements under section 251(c)(3).[973] GTE, for example, argues that the Commission should not permit requesting carriers to use unbundled transport elements to avoid access charges.[974] Similarly, Ameritech states that the 1996 Act prohibits arbitrary price distinctions between switched and special transport, and that, if interoffice facilities are unbundled from tandem switching, no such distinction can be made.[975] Other parties maintain that the 1996 Act requires cost-based pricing of all unbundled elements, including transport elements.[976]

436. A few parties oppose a requirement that incumbent LECs unbundle facilities that correspond to interstate transport and special access rate elements.[977] Cincinnati Bell argues that these elements are already available through existing tariffs, and therefore should not be required to be offered as unbundled elements pursuant to the 1996 Act.[978] MECA argues that local transport and special access facilities are toll access facilities and therefore are not necessary to

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[969] *Id.*; Telecommunications Resellers Ass'n comments at 35; TIA comments at 13.

[970] MCI comments at 46.

[971] NYNEX comments at 63 n.126; LDDS reply at 18.

[972] Texas Commission comments at 18.

[973] *See e.g.*, GTE comments at 38; CompTel comments at 45; Ameritech comments at 43.

[974] GTE comments at 38.

[975] Ameritech comments at 43.

[976] ACSI comments at 42; MCI comments at 32.

[977] *See, e.g.*, MECA comments at 38; Cincinnati Bell comments at 18.

[978] Cincinnati Bell comments at 18.

provide competitive basic local exchange service.[979] MECA also states that any requirement concerning local transport and special access should not apply to any LEC that was not covered by the MFJ restrictions and, in order to minimize arbitrage opportunities, any modifications to local transport and special access must wait until the LECs have restructured their local rates.[980]

437. TCC urges the Commission to define dedicated transport as an interoffice transmission path dedicated to a single carrier, including multiplexing and grooming, redundant facilities, and cross-office wiring to a digital cross-connect panel.[981] ACSI argues that the Commission should require incumbent LECs to make both dedicated and switched transport available at the DS-0, DS-1, DS-3 and Optical Carrier levels, which should be offered as completely unbundled links between serving wire centers (SWCs) and interconnector points-of-presence, the central office and the SWC, the end office and the tandem, and the SWC and the tandem.[982] Teleport advocates that interoffice trunking facilities be defined in terms of their underlying transmission characteristics without reference to the use of the facility.[983]

438. ALTS argues that, since there are currently well-defined standards for transport, there should be no impediment to requiring equivalent levels of technical performance among competing carriers, *i.e.*, no meaningful distinctions among the technical performance of different DS1s.[984] Therefore, as in the case with local loops, ALTS contends that competitors should receive the same or better ordering, provisioning, and installation service as the incumbent provides itself and that penalties should be assessed if deadlines are not met.[985]

c. Discussion

439. We conclude that incumbent LECs must provide interoffice transmission facilities on an unbundled basis to requesting carriers. The record supports our conclusion that such access is technically feasible and would promote competition in the local exchange market. We

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[979] MECA comments at 38.

[980] MECA comments at 38.

[981] TCC comments at 38; *see also* NYNEX comments at 63 for a similar definition.

[982] ACSI comments at 41.

[983] Teleport comments at 37.

[984] ALTS comments at 30.

[985] *Id.* at 30-31.

note that the 1996 Act requires BOCs to unbundle transport facilities prior to entering the in-region, interLATA market.[986]

440. We require incumbent LECs to provide unbundled access to shared transmission facilities between end offices and the tandem switch.[987] Further, incumbent LECs must provide unbundled access to dedicated transmission facilities between LEC central offices or between such offices and those of competing carriers. This includes, at a minimum, interoffice facilities between end offices and serving wire centers (SWCs), SWCs and IXC POPs, tandem switches and SWCs, end offices or tandems of the incumbent LEC, and the wire centers of incumbent LECs and requesting carriers. The incumbent LEC must also provide, to the extent discussed below, all technically feasible transmission capabilities, such as DS1, DS3, and Optical Carrier levels (*e.g.* OC-3/12/48/96) that the competing provider could use to provide telecommunications services. We conclude that an incumbent LEC may not limit the facilities to which such interoffice facilities are connected, provided such interconnection is technically feasible, or the use of such facilities. In general, this means that incumbent LECs must provide interoffice facilities between wire centers owned by incumbent LECs or requesting carriers, or between switches owned by incumbent LECs or requesting carriers. For example, an interoffice facility could be used by a competitor to connect to the incumbent LEC's switch or to the competitor's collocated equipment. We agree with the Texas Commission that a competitor should have the ability to use interoffice transmission facilities to connect loops directly to its switch. We anticipate that these requirements will reduce entry barriers into the local exchange market by enabling new entrants to establish efficient local networks by combining their own interoffice facilities with those of the incumbent LEC.

441. The ability of new entrants to purchase the interoffice facilities we have identified will increase the speed with which competitors enter the market. By unbundling various dedicated and shared interoffice facilities, a new entrant can purchase all interoffice facilities on an unbundled basis as part of a competing local network, or it can combine its own interoffice facilities with those of the incumbent LEC. The opportunity to purchase unbundled interoffice facilities will decrease the cost of entry compared to the much higher cost that would be incurred by an entrant that had to construct all of its own facilities. An efficient new entrant might not be able to compete if it were required to build interoffice facilities where it would be more efficient to use the incumbent LEC's facilities. We recognize that there are alternative suppliers of interoffice facilities in certain areas. We are convinced, however, that entry will be facilitated if competitors have greater, not fewer, options for procuring interoffice facilities as part of their local networks, and that Congress intended for competitors to have these options available from competitors. Thus, the rules we establish for the unbundled interoffice facilities should

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[986] 47 U.S.C. § 271(c)(2)(B)(v).

[987] Section V.I. addresses unbundled access to the tandem switching element.

maximize a competitor's flexibility to use new technologies in combination with existing LEC facilities.

442. We find that it is technically feasible for incumbent LECs to unbundle the foregoing interoffice facilities as individual network elements. The interconnection and unbundling arrangements among the larger LECs, IXCs, and CAPs that resulted from our *Expanded Interconnection* rules confirm the technical feasibility of unbundling interoffice facilities used by incumbent LECs to provide special access and switched transport.[988] As AT&T and Telecommunications Resellers Association point out, IXCs currently interconnect with incumbent LECs' transport facilities pursuant to standard specifications.[989] We also note that commenters do not identify technical feasibility problems with unbundling interoffice facilities.

443. We also find that it is technically feasible for incumbent LECs to unbundle certain interoffice facilities not addressed in our *Expanded Interconnection* proceeding. First, we conclude that an incumbent LEC must provide unbundled access to interoffice facilities between its end offices, and between any of its switching offices and a new entrant's switching office, where such interoffice facilities exist. This allows a new entrant to purchase unbundled facilities between two end offices of the incumbent LEC, or between the new entrant's switching office and the incumbent LEC's switching office. Although our *Expanded Interconnection* rules did not specifically require incumbent LECs to unbundle these facilities, commenters do not identify any potential technical problem with such unbundling. Moreover, some LECs already offer unbundled dedicated interoffice facilities, for example, between their end offices and SWCs for exchange access.

444. In addition, as a condition of offering unbundled interoffice facilities, we require incumbent LECs to provide requesting carriers with access to digital cross-connect system (DCS) functionality. A DCS aggregates and disaggregates high-speed traffic carried between IXCs' POPs and incumbent LECs' switching offices, thereby facilitating the use of cost-efficient, high-speed interoffice facilities. AT&T notes that the BOCs, GTE, and other large LECs currently make DCS capabilities available for the termination of interexchange traffic.[990] We find that the use of DCS functionality could facilitate competitors' deployment of high-speed interoffice facilities between their own networks and LECs' switching offices. Therefore, we require incumbent LECs to offer DCS capabilities in the same manner that they offer such capabilities to IXCs that purchase transport services.

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[988] *See, e.g.*, MCI comments at 32; NCTA comments at 42; GST comments at 24; TIA comments at 13; MFS comments at 47-48.

[989] AT&T comments at 22; Telecommunications Resellers Ass'n comments at 35.

[990] Letter from Bruce Cox, Government Affairs Director, AT&T, to William F. Caton, Acting Secretary, FCC, July 18, 1996.

445. We disagree with PacTel's assertion that it is not technically feasible for incumbent LECs to provide DCS functionality to competitors that purchase unbundled interoffice facilities.[991] First, contrary to PacTel's assertion, we do not require incumbent LECs to develop new arrangements for the offering of DCS capabilities to competitors. We only require that DCS capabilities be made available to competitors to the extent incumbent LECs offer such capabilities to IXCs. Second, PacTel suggests the provision of DCS capabilities requires physical partitioning of the DCS equipment in order to prevent carriers from gaining control of each other's traffic.[992] We do not require such partitioning for the provision of DCS capabilities. As noted above, we only require incumbent LECs to permit competitors to use DCS functionality in the same manner that incumbent LECs now permit IXCs to use such functionality.

446. Section 251(d)(2)(A) requires the Commission to consider whether "access to such network elements as are proprietary in nature is necessary."[993] Commenters do not identify any proprietary concerns relating to the provision of interoffice facilities that LECs are required to unbundle. We also note that many of these facilities are also currently offered on an unbundled basis to competing carriers. Therefore, the record provides no basis for withholding these facilities from competitors based on proprietary considerations.

447. Section 251(d)(2)(B) requires the Commission to consider whether the failure to provide access to an unbundled element "would impair the ability of the telecommunications carrier seeking access to provide the services that it seeks to offer."[994] We have interpreted the term "impair" to mean either increased cost or decreased service quality that would result from using network elements other than the one sought.[995] Certain commenters contend that unbundled access to these facilities would improve their ability to provide competitive local exchange and exchange access service.[996] MCI, for example, argues that its inability to obtain unbundled access to trunks between an incumbent LEC's end offices raises its cost of providing local service.[997] Accordingly, we conclude that the section 251(d)(2)(B) requires incumbent LECs to provide access to shared interoffice facilities and dedicated interoffice facilities between

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[991] Letter from Alan Ciamporcero, Vice President, PacTel, to William F. Caton, Acting Secretary, FCC, July 17, 1996 (PacTel July 17 *Ex Parte*).

[992] *Id.*

[993] 47 U.S.C. § 251(d)(2)(A).

[994] 47 U.S.C. § 251(d)(2)(B).

[995] *See supra* Section V.E.

[996] *See, e.g.*, AT&T Mar. 21 Letter; LDDS Comments at 47.

[997] MCI comments at 46.

the above-identified points in incumbent LECs' networks, including facilities between incumbent LECs' end offices, new entrant's switching offices and LEC switching offices, and DCSs. We believe that access to these interoffice facilities will improve competitors' ability to design efficient network architecture, and in particular, to combine their own switching functionality with the incumbent LEC's unbundled loops.[998]

448. We reject Cincinnati Bell's argument that existing tariffs for transport and special access services filed pursuant to our *Expanded Interconnection* rules fulfill our obligation to implement the requirements of section 251(c).[999] First, the *Expanded Interconnection* rules require the unbundling of interstate transport services only by Class A carriers [1000] whereas section 251(c) requires network unbundling by all incumbent LECs, except for carriers that are exempt under section 251(f) from our interconnection rules.[1001] Consequently, some non-Class A carriers that were not subject to our *Expanded Interconnection* requirements will be required to comply with the requirements of this Order. Second, we find that the Class A carriers' existing tariffs for unbundled transport elements do not satisfy the unbundling requirement of section 251(c), as suggested by Cincinnati Bell, because such tariffs are only for interstate access services, not for unbundled interoffice facilities. As such, existing federal tariffs for transport and special access exclude *intra*state transport, and therefore are not equivalent to unbundled interoffice facilities, which we have determined to be nonjurisdicational in nature.

449. We also disagree with MECA, GTE, and Ameritech that we should consider "pricing distortions" in adopting rules for unbundled interoffice facilities.[1002] Section , below, addresses the pricing of unbundled network elements identified pursuant to section 251(c)(3) as it relates to our current access charge rules. Nor are we are persuaded by MECA's argument that incumbent LECs not subject to the MFJ should not be required to unbundle transport facilities because, according to MECA, such facilities are unnecessary for local competition.[1003] As discussed above, the ability of a new entrant to obtain unbundled access to incumbent LECs' interoffice facilities, including those facilities that carry interLATA traffic, is essential to that competitor's ability to provide competing telephone service.

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[998] *See, e.g,* MCI comments at 22.

[999] Cincinnati Bell comments at 18.

[1000] Class A carriers are those exchange carriers having more than $100 million in total company regulated revenues. *See 1990 Cost Support Order,* 5 FCC Rcd 1364, (Com. Car. Bur. 1990); *Commission Requirements for Cost Support Material to be Filed with 1989 Annual Access Tariffs,* 4 FCC Rcd 1662, 1663 (Com. Car. Bur. 1988).

[1001] *See infra* Section XII, addressing the exemption for rural LECs.

[1002] MECA comments at 38, GTE comments at 38; Ameritech comments at 43.

[1003] MECA comments at 38.

450. We do not impose specific terms and conditions for the provision of unbundled interoffice facilities. We believe that the rules we establish in this Order for all unbundled network elements adequately address ALTS's concern regarding the provisioning, billing, and maintenance of unbundled transport facilities.[1004] We also decline at this time to address the unbundling of incumbent LECs' "dark fiber." Parties that address this issue do not provide us with information on whether dark fiber qualifies as a network element under sections 251(c)(3) and 251(d)(2). Therefore, we lack a sufficient record on which to decide this issue. We will continue to review and revise our rules in this area as necessary.

451. Rural Telephone Coalition contends that incumbent LECs should not be required to construct new facilities to accommodate new entrants.[1005] We have considered the economic impact of our rules in this section on small incumbent LECs. In this section, for example, we expressly limit the provision of unbundled interoffice facilities to *existing* incumbent LEC facilities. We also note that section 251(f) of the 1996 Act provides relief for certain small LECs from our regulations under section 251.

4. Databases and Signaling Systems

a. Background

(1) NPRM

452. In the NPRM, we tentatively concluded that incumbent LECs should be required to unbundle access to their signaling systems and databases as network elements.[1006] We asked commenters to identify points at which carriers interconnect with SS7 networks[1007] today, as well as the technical feasibility of establishing other points of access and interconnection.[1008] We also asked commenters to identify those signaling and database functions currently provided by incumbent LECs on an unbundled basis, and other functions not currently offered by incumbent LECs, that the parties believe should be offered on an unbundled basis.[1009]

[1004] Section V.G addresses terms and conditions governing incumbent LECs' provision of access to unbundled network elements.

[1005] Rural Tel. Coalition reply at 36.

[1006] NPRM at para. 107.

[1007] A signaling network that is physically separate from the voice networks.

[1008] NPRM at para. 108.

[1009] NPRM at para. 108.

453. In the NPRM, we noted the possibility that competitors that provide local exchange service using resold incumbent LEC services or unbundled elements might want to connect an alternative call processing database to the incumbent LEC's SS7 network in order to offer services and features not available through the incumbent LEC's own SS7 network databases.[1010]

454. We also sought comment on unbundling access to the Advanced Intelligent Network (AIN), and referenced our separate Intelligent Networks proceeding which deals with related issues.[1011] We sought comment on whether to unbundle access to AIN facilities and functionalities.

(2) SS7 Signaling Network Technology

455. Signaling systems facilitate the routing of telephone calls between switches. Most LECs employ signaling networks that are physically separate from their voice networks, and these "out-of-band" signaling networks simultaneously carry signaling messages for multiple calls. In general, most LECs' signaling networks adhere to a Bellcore standard Signaling System 7 (SS7) protocol.[1012]

456. SS7 networks use signaling links to transmit routing messages between switches, and between switches and call-related databases. A typical SS7 network includes a signaling link, which transmits signaling information in packets, from a local switch to a signaling transfer point (STP), which is a high-capacity packet switch.[1013] The STP switches packets onto other links according to the address information contained in the packet.[1014] These additional links extend to other switches, databases, and STPs in the LEC's network.[1015] A switch routing a call

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[1010] NPRM at para. 112.

[1011] NPRM at para. 113; *see In the Matter of Intelligent Networks*, CC Docket No. 91-346, Notice of Inquiry, 6 FCC Rcd 7256 (1991), Notice of Proposed Rulemaking, 8 FCC Rcd 6813 (1993) (*Intelligent Networks*). We incorporated the record of the *Intelligent Network* proceeding into this docket by reference. NPRM at para. 113 n.151.

[1012] The SS7 protocol is widely used and has been adopted by Bellcore, the American National Standards Institute, and the International Telecommunication Union--Telecommunication Standardization Sector. *See* Bellcore, BOC Notes on the LEC Networks (1994).

[1013] STPs are usually deployed in pairs for redundancy purposes. *Id.*

[1014] Any element capable of handling SS7 signaling messages is also generally referred to as a Signaling Point. Each Signaling Point has a unique network address and every SS7 signaling message has a routing label containing addresses for the origination and destination of the message plus a signaling link selection code. *Id.*

[1015] For example, an STP to STP connection is generally used for inter-network interconnection. An STP to switch connection is a common part of the SS7 network and is used to connect end offices to the SS7 network. A connection between a call-related database and a switch is usually done via a connection at an STP (*i.e.*, database to STP to switch). *Id.*

to another switch will initiate a series of signaling messages via signaling links through an STP to establish a call path on the voice network between the switches.

457. As mentioned above, the SS7 network also employs signaling links (via STPs) between switches and call-related databases, such as the Line Information Database (LIDB), Toll Free Calling (*i.e.*, 800, 888 number) database, and AIN databases. These links enable a switch to send queries via the SS7 network to call-related databases, which return customer information or instructions for call routing to the switch.[1016]

458. From the perspective of a switch in a LEC network, the databases discussed above merely supply information or instructions. Updating or populating the information in such databases, however, takes place through a separate process involving different equipment. Carriers input information directly into a service management system (SMS), which in turn downloads such information into the individual databases.

459. The Advanced Intelligent Network (AIN) is a network architecture that uses distributed intelligence in centralized databases to control call processing and manage network information, rather than performing those functions at every switch. An AIN-capable switch[1017] halts call progress when a resident software "trigger" is activated, and uses the SS7 network to access intelligent databases, known as Service Control Points (SCPs), that contain service software and subscriber information, for instruction on how to route, monitor, or terminate the call.[1018] AIN is being used in the deployment of number portability, wireless roaming, and such advanced services as same number service (i.e., 500 number service) and voice recognition dialing. AIN services are designed and tested in an off-line computer known as a Service Creation Environment (SCE). Once a service is successfully tested, the software is transferred to an SMS that administers and supports SCP databases in the network. The SMS then regularly downloads software and information to an SCP where interaction with the voice network takes place via the signaling links and STPs discussed above.

b. Comments

[1016] Switch software commonly referred to as a "trigger" interrupts call progress, in order for the switch to query call-related databases. *Id.*

[1017] A switch with AIN capabilities is referred to as a service switching point (SSP). *Id.*

[1018] Switch queries and database responses use a part of the SS7 protocol called the Transaction Capabilities Application Part (TCAP). *Id.*

460. Almost all parties, including incumbent LECs, support the Commission's tentative conclusion to require incumbent LECs to unbundle access to their signaling systems.[1019] Parties generally agree that access to SS7 network signaling is essential to the provision of competitive local exchange service and that providing such access is technically feasible.[1020] Indeed, most BOCs state that they already provide access to their signaling systems.[1021] BellSouth states that it currently provides such access at its STPs via signaling links to all carriers, including IXCs, independent telephone companies, wireless carriers, and other local exchange carriers.[1022] Commenters also report that independent SS7 network aggregators currently provide access to signaling systems to many independent local exchange and interexchange carriers, and to some competitive local carriers.[1023] In addition, several state commissions note that they already have, or are considering, a requirement that incumbent LECs unbundle access to their signaling systems, including associated databases.[1024]

[1019] *See, e.g.*, Ad Hoc Telecommunications Users Committee comments at 24; ACSI comments at 42; ALTS comments at 31; AT&T comments at 23; Comcast comments at 20; Ericsson comments at 5; GCI comments at 12; GST comments at 24; Intermedia comments at 13; MFS comments at 48-49; MCI comments at 32; Sprint comments at 39; Teleport comments at 37; Time Warner comments at 44-45; Ameritech comments at 46-47; BellSouth comments at 43; NYNEX comments at 71; PacTel comments at 57-60; Alabama Commission comments at 18; District of Columbia Commission comments at 23; Florida Commission comments at 17; Mass. Commission comments at 7; New York Commission comments at 27; Wyoming Commission comments at 23. These parties also generally support access to databases associated with signaling. Some parties, however, urge the Commission to weigh the potential harm from access to database and signaling systems, which might give someone the opportunity to cause inadvertent or malicious damage to large parts of the public switched network. Secretary of Defense comments at 6-7; Sprint comments at 39-40; Lincoln Tel. reply at 15; GVNW comments at 20, 29 (screening necessary to prevent network failures from proliferating between interconnected networks).

[1020] *See, e.g.*, Ad Hoc Telecommunications Users Committee comments at 24; ACSI comments at 42; ALTS comments at 31; AT&T comments at 23; Citizens Utilities comments at 15; CompTel comments at 43; Continental comments at 19; Ericsson comments at 5; Frontier comments at 16; GCI comments at 12; LCI comments at 18; MCI comments at 32; NEXTLINK comments at 23; Sprint comments at 39-40; TIA comments at 14; Ameritech comments at 47; Bell Atlantic comments at 27-28; GTE comments at 38-41; U S West comments at 57-58; California Commission comments at 26; Colorado Commission comments at 24; Louisiana Commission comments at 5; Wyoming Commission comments at 23-24; USTN reply at 4.

[1021] Ameritech comments at 46-47; Bell Atlantic comments at 27-30; BellSouth comments at 43; GTE comments at 40-41; NYNEX comments at 71; PacTel comments at 58-59; SBC comments at 46-48; Sprint comments at 39-41; USTA comments at 36.

[1022] BellSouth comments at 43.

[1023] AT&T comments at 23; BellSouth comments at 44-45; NYNEX comments at 71; GVNW comments at 29 (most small incumbent LECs obtain SS7 functionalities from US Intelco or a neighboring large incumbent LEC); GTE comments at 40-41 n.61 (competitors include Independent Telecommunications Network, Southern New England Telephone, and GTE Intelligent Network Services); NYNEX comments at 71; PacTel comments at 58; Bell Atlantic comments at Attachment 3, 16 (independent SS7 providers offer an out-of-band signaling channel which allows the service providers to interconnect with other SS7 networks); USTN reply at 1. Commenters note that these aggregators also provide access to databases associated with signaling.

[1024] *See, e.g.*, California Commission comments at 26 (under consideration by the California Commission); Colorado Commission comments at 24; Louisiana Commission comments at Attachment A; Michigan Commission comments at 12; Texas Commission comments at 19; Wyoming Commission comments at 23-24 (Wyoming Commission has draft rules only); In the Matter of the Commission Investigation Relative to the Establishment of Local Exchange

461. Some incumbent LECs argue that, because there are competitive providers for SS7 network services, there is no need for the Commission to require incumbent LECs to unbundle these network elements for competing carriers.[1025] Most potential competitors counter that access to incumbent LEC SS7 networks will be necessary for some carriers, either because alternative providers of signaling systems and databases will not be available to them or because it will not be technically feasible to use any signaling network other than the incumbent LEC's SS7 network.[1026] AT&T argues that, even where there are alternative SS7 networks, unbundling of the incumbent's SS7 network will increase competition and help control costs for new entrants.[1027]

462. Some incumbent LECs contend that the 1996 Act only requires them to unbundle access to their signaling systems and databases to the extent necessary to support call routing and completion for competitors.[1028] Other parties, including IXCs, disagree and contend that access to incumbent LECs' signaling systems under the 1996 Act should include access to all associated databases and use of deployed AIN technology, and that such access is necessary in order for them to compete successfully in the local exchange market.[1029]

463. Many parties argue that open access and interconnection to incumbent LECs' SS7 networks and signaling protocols are critical to maintaining the seamless routing and completion of traffic between competing carriers.[1030] Frontier asserts that the use of proprietary or closed protocols by incumbent LECs effectively can prevent interconnected networks from

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Competition and Other Competitive Issues, Case No. 95-845-TP-COI at 49 (Ohio Commission June 12, 1996) (access to SS7 functionalities, and necessary customer databases such as 911, LIDB, Toll Free Calling, and Directory Assistance).

[1025] *See, e.g.*, Bell Atlantic comments at 27-28; BellSouth comments at 44-45; GTE comments at 40-41 (access is not necessary under section 251(d)(2)(A) to the extent it is proprietary and denial of such access would not impair the provision of competitive services under section 251(d)(2)(B) to the extent it is not proprietary); PacTel comments at 40, 57-60; NYNEX comments at 71 (there are already alternative suppliers of these functions, and as demand grows, more will enter the market).

[1026] *See* AT&T comments at 23; Letter from Frank Simone, Regulatory Division Manager, Federal Government Affairs, AT&T to William Caton, Acting Secretary, FCC, June 13, 1996 (AT&T June 13 *Ex Parte*).

[1027] AT&T comments at 23; *accord* Telecommunications Resellers Ass'n comments at 36.

[1028] ALLTEL comments at 10; Ameritech comments at 46-47; Bell Atlantic comments at 22.

[1029] *See, e.g.*, AT&T comments at 23; MCI reply at 30-31.

[1030] ACSI comments at 45 (open access is important to support CLASS features and access to databases); Frontier comments at 16; GST comments at 24; MCI comments at 33; New York Commission comments at 27 (signaling systems may represent a bottleneck to efficient exchange of traffic for all LECs); Texas Commission comments at 20; Wyoming Commission comments at 24; USTN reply comments at 2.

communicating with each other.[1031] Several state commissions have proposed or required that incumbent LECs provide unaltered transmission of signaling information between interconnecting carriers and their customers.[1032] In support of such access, several commenters cite recent interconnection agreements that provide for the exchange of SS7 signaling messages.[1033]

464. Virtually all parties agree that physical access, or interconnection, to the incumbent LEC's SS7 network should occur at the STP, because it provides essential network management and security functions that are not performed by other SS7 network elements.[1034] Commenters assert that such access at the STP would provide other carriers with access to all of the functions of an incumbent LEC's SS7 network.[1035] A few parties urge the Commission to require incumbent LECs to unbundle direct access to SCP databases.[1036] Most commenters, including all of the incumbent LECs, assert that such access is not technically feasible because SCP databases do not perform the mediation functions present at the STP.[1037] Some incumbent LECs argue that direct access to any SS7 network elements, other than the STP, would require development of additional industry standards before such access could be considered technically feasible.[1038]

[1031] Frontier comments at 16 n.31 (such anti-competitive behavior would be contrary to the pro-competitive goals of the 1996 Act); *accord* Wyoming Commission comments at 24 (incumbent LECs may not claim a proprietary right to signaling protocols).

[1032] Wyoming Commission comments at 23-24 (Wyoming Commission draft rules require unaltered transmission of signaling information); Texas Commission comments at 19 (Texas law requires interconnecting carriers to provide nondiscriminatory access to ensure the interoperability of networks and service to end users).

[1033] Georgia Commission comments at Attachment E 6-7 (BellSouth and MCIMetro interconnection agreement provides for the exchange of SS7 signaling messages including the Transaction Capabilities Application Part (TCAP) part of the SS7 protocol that supports *inter alia* CLASS features).

[1034] *See, e.g.*, Ameritech comments at 48-50; Bell Atlantic comments at 27; MCI comments at 34-35; NYNEX comments at 71; Sprint comments at 40. Part of the STP security function is to screen incoming signaling traffic for unusable messages and to prevent them from reaching the SCP or switch where they could potentially cause reliability and performance problems. GVNW comments at 29; SBC comments at 46; USTA comments at 36. The STP also prevents unauthorized access to proprietary information. GTE comments at 39-40.

[1035] Bell Atlantic comments at 27; GTE comments at 39; USTA comments at 36. *See* AT&T comments at 24 n.25.

[1036] Frontier comments at 16; LCI comments at 18.

[1037] *See, e.g.*, ACSI at 45; Bell Atlantic comments at 27-28; Colorado Commission comments at 24 (Colorado Commission requires unbundled access to the SCP via the STP); Comcast comments at 18; GTE comments at 40 (until appropriate mediation techniques and associated software and hardware are developed, access to SCP databases should remain through the STP); PacTel comments at 59; NYNEX comments at 71; SBC comments at 47; Ameritech reply at 20-21 (industry has yet to develop standards for SCP access); AT&T reply at 19-20 n.32; PacTel reply at 21-22.

[1038] GTE comments at 40; SBC comments at 47; Sprint comments at 40.

465. Several parties advocate access to unbundled signaling links and STPs.[1039] BellSouth, however, argues that incumbent LECs should only have to provide access to their SS7 network at an STP for competitors.[1040] Parties describe several methods for competing carriers to access unbundled elements of the incumbent LEC's SS7 network. A new entrant could provide or purchase signaling links to connect its switch to the incumbent LEC's STP, or it could provide its own signaling link and STP and then connect its STP to the incumbent LEC's STP.[1041] SBC adds that a competing carrier could also contract with a third party that has already established signaling link connectivity to the incumbent LEC's STPs.[1042] SBC also notes that it requires certification of new companies before implementing SS7 interconnection in order to protect the integrity of its network.[1043]

466. Commenters disagree over what databases qualify as network elements under the 1996 Act. Some parties, including IXCs and other potential local competitors, argue that access to all incumbent LEC databases should be unbundled as network elements.[1044] This would include both incumbent LEC call processing and non-call processing databases.[1045] Most incumbent LECs counter that administrative or "back office" databases do not fall within the definition of network element in the 1996 Act.[1046] Incumbent LECs supporting this limited

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[1039] ALTS comments at Attachment A, 23; AT&T comments at 23; Cable & Wireless comments at 19, 24-25; Citizens Utilities comments at 15; GCI comments at 12; Frontier comments at 16; Telecommunications Resellers Ass'n comments at 35; NYNEX comments at 71 (provides unbundled access to network signaling resources for call set up and for database queries through unbundled signaling links and ports at its STPs); PacTel reply at 21-22; TIA comments at 14; California Commission comments at 26 (California Commission is considering *inter alia*, unbundling STPs and signaling links); Colorado Commission comments at 26; Wyoming Commission comments at 23-24 (Wyoming Commission draft rules require unbundling of signaling links, STPs, and SCPs); Iowa Commission comments at Appendix B, 4 (arguing that signaling links and STPs must be unbundled by incumbent LECs).

[1040] BellSouth reply at 23.

[1041] SBC comments at 47; Sprint comments at 40 (currently provides access to its SS7 network through "A" signaling links which run from the end office to the STP and through "B" signaling links which connect the STPs of two separate SS7 networks); U S West comments at 48 (competitors should be able to provide their own transport to an STP or purchase transport from the incumbent LEC); PacTel comments at 58 (Pacific Bell proposed, before the California Commission, to unbundle its signaling links that provide interconnection between other carriers' switches or STPs to Pacific Bell's STPs).

[1042] SBC comments at 47.

[1043] SBC comments at 47.

[1044] ACSI comments at 42-44; AT&T comments at 23-26; ALTS comments at 31; MCI comments at 32-33.

[1045] ACSI comments at 42-44; ALTS comments at 31; MCI comments at 32-33 (both call processing and non-call processing databases necessary to route, complete and bill simple and complex calls should be unbundled as network elements).

[1046] Ameritech comments at 48-51; Bell Atlantic reply at 12-23; GTE reply at 21; Lincoln Tel. reply at 12; NYNEX reply at 34.

definition also argue that only those databases used for the routing and completion of calls are required to be unbundled by the 1996 Act.[1047]

467. A number of parties urge the Commission to require incumbent LECs to provide competing carriers with the same access to their databases that they provide to themselves.[1048] Some potential local competitors argue that access to a number of existing incumbent LEC databases is important if they are to compete effectively with the incumbent LEC.[1049] Many parties, including most incumbent LECs, identify access to the Line Information Database (LIDB)[1050] and the Toll Free Calling (*i.e.*, 800, 888 numbers) database[1051] as important to the provision of local service.[1052] Some potential local competitors contend that databases are a significant expense and that they will be prohibitively costly to duplicate immediately or in the near future.[1053] The Louisiana Commission notes that it currently requires incumbent LECs to provide competitive providers with access to LIDB, Toll Free Calling, and AIN databases through signaling interconnection such that the functionality, quality, terms and conditions are equal to those the incumbent LEC provides to itself.[1054] Several incumbent LECs respond that

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[1047] Bell Atlantic reply at 12-23; GTE reply at 21; Lincoln Tel. reply at 12; NYNEX reply at 34.

[1048] ALTS comments at 31; ACSI comments at 42-43; MCI comments at 32-33; NCTA comments at 42 (competitors' customer information should be included in incumbent LEC databases on the same price, terms, and conditions as the incumbent LEC provides for itself); Teleport comments at 37; Wyoming Commission comments at 23 (nondiscriminatory access for call routing and completion); GCI comments at 13; LCI comments at 18; Vartec comments at 5.

[1049] ACSI comments at 42-43; MCI comments at 32-37. Letter from Leonard Sawicki, MCI Telecommunications to Robert Tanner, Common Carrier Bureau, FCC, July 3, 1996 (MCI July 3 *Ex Parte*). MCI identifies LIDB, Toll Free Calling, Local Number Portability and Directory Assistance databases as call processing databases necessary for new entrants to offer competitive local telephone service. *Id.*

[1050] Parties described the LIDB as a database containing information as to whether a subscriber number is a valid working line, telephone line type, call screening information and validation information for calling cards. *See* MCI July 3 *Ex Parte*. *See In the Matter of Local Exchange Carrier Line Information Database*, Report and Order, 8 FCC Rcd 7130 (1993).

[1051] Toll free calling (*i.e.*, 800, 888 numbers) is a nationwide service generally used to bill the called party. It utilizes a single national SMS and ten regional toll free calling SCP databases. Toll Free Calling SCPs are currently owned by Ameritech, Bell Atlantic, BellSouth, GTE, NYNEX, PacTel, SBC, SNET, Sprint (local), and U S West. The national SMS is owned by Bellcore and operated by a third party administrator. *See In the Matter of Toll Free Service Access Codes*, Notice of Proposed Rulemaking, 10 FCC Rcd 13692 (1995).

[1052] ACTA comments at 14; ALTS comments at 31; Ameritech comments at 47 (call routing and completion functions sometimes require supplemental calling functions or information such as 800 number routing data or credit verification); GTE comments at 24; U S West comments at 48; Bell Atlantic reply at 12-23; GTE reply at 18; NYNEX reply at 34.

[1053] AT&T comments at 23-24; NCTA comments at 42; Telecommunications Resellers Ass'n comments at 36.

[1054] Louisiana Commission comments at 5; *see* Michigan Commission comments at 12 (requires non-discriminatory access to databases necessary for the provision of local exchange service including LIDB and Toll Free Calling databases).

they already provide such access to the LIDB and Toll Free Calling databases via their SS7 network.[1055] GVNW argues that all access to call-related databases must be mediated to prevent unauthorized messages from entering an incumbent's database.[1056]

468. Many potential local competitors argue that access to the incumbent LEC's LIDB should be unbundled.[1057] Most parties agree that query access to the LIDB is technically feasible.[1058] Most potential local competitors contend that they also need access to the incumbent LECs' administrative database (SMS) that is used to input customer data into the LIDB.[1059] AT&T argues that such access is technically feasible, and can be provided to competitors in the same manner that the incumbent LEC now does for itself.[1060] Other parties propose that the Commission require the incumbent LEC to input a competing carriers' customer information into its LIDB for the competitor.[1061]

469. Several parties argue that the Commission should unbundle the Toll Free Calling database for access by competitors.[1062] Most incumbent LECs commented that they already

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[1055] Ameritech comments at 47; BellSouth comments at 43; GTE comments at 40; NYNEX comments at 71; Sprint comments at 40.

[1056] GVNW comment at 29; *see also* MECA comments at 38-39 (competitors should not have direct "on-line" access to incumbent databases).

[1057] ACTA comments at 14; ACSI comments at 42 (access to the LIDB is important to identify presubscribed interexchange carriers); GST comments at 25; ALTS comments at 31.

[1058] AT&T comments at 24; ALTS comments at 31; Ameritech comments at 46-51; Bell Atlantic comments at 27-28; GTE comments at 38-41; Louisiana Commission comments at 5; NCTA comments at 42; NYNEX reply at 34; Teleport comments at 37-38; U S West comments 48.

[1059] AT&T comments at 25-26; American Network Exchange comments at 5 (requesting access to LIDB, but without the current restrictions imposed by *In the Matter of Policies and Rules Concerning Local Exchange Carrier Validation and Billing Information for Joint Use Calling Cards*, CC Docket No. 91-115); ACSI comments at 42; Citizens Utilities comments at 15; NCTA comments at 42; Teleport comments at 37.

[1060] AT&T comments at 26. The conditions, (*e.g.*, type of media, electronic information transfer method) applicable to competitor interconnection with such databases should be identical to those the incumbent LEC uses for itself. *Id.*

[1061] Georgia Commission comments at 21 (under BellSouth-MCIMetro interconnection agreement, BellSouth will enter MCIMetro line information into its LIDB so as to enable MCIMetro customers to participate in alternative billing systems, such as collect calling and third number billing).

[1062] ALTS comments at 31; American Network Exchange comments at 5; ACSI comments at 43; Louisiana Commission comments at 5.

provide query access to their Toll Free Calling databases.[1063] In addition, access to the single national SMS is available under tariff administered by Bellcore.[1064]

470. Parties also argue that they need equal access to 911 and E911 services, including the underlying Automatic Location Indicator (ALI) database.[1065] Several state commissions have also asserted that such access is necessary for new entrants as well as incumbent LECs.[1066] NCTA asserts that competitors must have access to incumbent LEC systems for 911 and E911 services because currently only incumbent LECs maintain them.[1067]

471. Some competitive providers urge the Commission to require incumbent LECs to unbundle access to their AIN.[1068] Several parties argue that AIN should be unbundled to allow competitors to access the incumbent LEC's AIN physically at all points that the incumbent does for itself.[1069] Cable & Wireless argues that larger carriers may be able to design and build their own AIN technology, but smaller carriers may not be able to afford to deploy all of the necessary equipment.[1070] MCI argues that access to the incumbent LEC's AIN capabilities would allow

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[1063] GTE comments at 40; Sprint comments at 40; NYNEX reply at 34. Reservation and activation of 800 and 888 numbers is available today as an unbundled tariff offering from many common carriers and independent suppliers through the RESP ORG process. *See In the Matter of Toll Free Service Access Codes*, Notice of Proposed Rulemaking, 10 FCC Rcd 13692 (1995).

[1064] Access to individual 800 and 888 numbers is achieved through the RESP ORG process administered by Bellcore. Customers contact a RESP ORG (which can be an IXC, LEC, wireless carrier, or a large organization like Westinghouse) which enters subscriber information into the 800 SMS, assigning a number to the subscriber. The SMS than loads the routing information into the SCPs, at which time the number is working and can be utilized by the subscriber. *See In the Matter of Toll Free Service Access Codes*, Notice of Proposed Rulemaking, 10 FCC Rcd 13692 (1995).

[1065] ACSI comments at 43; ALTS comments at 32; Citizens Utilities comments at 15; Comcast comments at 20; Continental comments at 19; GST comments at 25; MCI comments at 18, 33-34; NCTA comments at 42; Teleport comments at 37.

[1066] Georgia Commission comments at 19; Wyoming Commission comments at 23.

[1067] NCTA comments at 42.

[1068] Ad Hoc Telecommunications Users Committee comments at 24-25; ACTA comments at 18; ACSI at 42; Cable & Wireless comments at 23-25; CompTel comments at 43; GCI comments at 13; MCI comments at 33-34; Cable & Wireless reply at 23-24; USTN reply at 3-4. Letter from Genevieve Morelli, Vice President & general Counsel, CompTel to William Caton, Acting Secretary, FCC, June 14, 1996 (CompTel June 12 *Ex Parte*); Letter from Linda Oliver, Counsel for WorldCom to William Caton, Acting Secretary, FCC, June 14, 1996 (WorldCom June 14 *Ex Parte*).

[1069] CompTel comments at 43 (competitive providers should be able to interconnect with AIN elements at all points that ILECs interconnect currently); MCI comments at 35.

[1070] Cable & Wireless comments at 23 (access to the incumbent LEC's existing AIN platform including the SMS database, signaling links and SCPs will allow new entrants to bring new services to the market efficiently and quickly).

them to bring new services to the marketplace and enhance their ability to compete with the incumbent.[1071] Several commenters ask the Commission to adopt the approach of the Louisiana Commission which ordered unbundled access to incumbent LEC databases for all services that the incumbent LEC provides itself, including 800 number, LIDB, and AIN services.[1072] Sprint argues that access to AIN should be unbundled to the extent AIN is used by the incumbent LEC to provide call routing functions.[1073] Many incumbent LECs respond that AIN is still an evolving technology, and therefore it is not technically feasible for the Commission to require unbundled access.[1074] Some incumbent LECs also argue that AIN is not a signaling system or database, and therefore is not a network element under the Act.[1075]

472. A number of parties assert that currently the only technically feasible point of access to the incumbent LEC's AIN is at the incumbent LECs' SCE and SMS.[1076] Several competitive providers contend that access at the SCE and SMS would provide a competing carrier with the same ability to offer AIN-based services as the incumbent LEC without having to recreate initially all of the AIN elements.[1077] Ericsson notes that mere unbundling of databases and signaling elements is not likely to allow competitors to create and offer competing AIN services unless they have access to both a service creation environment and service management

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[1071] MCI comments at 35.

[1072] ACSI comments at 43; CompTel comments at 43-44; MCI comments at 35 (competitive providers should stand in the same relationship to AIN components as the ILEC does when it offers AIN services to its customers).

[1073] Sprint reply at 20 n.27.

[1074] BellSouth comments at 44; SBC comments at 44; PacTel reply at 22 (*Intelligent Networks* docket contains evidence that AIN unbundling is not technically feasible).

[1075] Bell Atlantic comments at 29; Ameritech reply at 21 (arguing that because there are no services provided via AIN that are not also provided via the switch, that AIN unbundling is not necessary for competitive providers).

[1076] Ameritech comments at 49 (Ameritech claims that it has offered to provide database access via its SMS and SCE in the *Intelligent Networks* proceeding, but also argues that such access is still under development and not yet technically feasible); GTE comments at 42 (record in CC Docket No. 91-346 contains persuasive evidence that, other than access to the SMS, access to AIN network elements is neither technically nor operationally feasible at this time); Sprint comments at 41; Ameritech reply at 15 (agreeing with Sprint's position on SMS access); Bell Atlantic comments at 29-30 (as demonstrated in the *Intelligent Networks* docket, the only point at which it is technically feasible to provide AIN access is at the Service Management System level); LCI comments at 18-19.

[1077] Ameritech comments at 49 (working on such access for third parties, although Ameritech believes it is not yet technically feasible); Bell Atlantic comments at 29 (access for third parties at the SMS would satisfy the requirements of section 251); Cable & Wireless comments at 24; Ericsson comments at 5-7; Sprint comments at 40 (access at the SMS is the only technically feasible point of interconnection for AIN that maintains network reliability); GVNW comments at 31 (competitor could create its own services in an incumbent LEC's SMS using the incumbent's SCE, which would protect the integrity of the incumbent LEC's AIN platform); LCI comments at 18 (SMS and SCE access are essential for competitors to provide advanced services).

system.[1078] Bell Atlantic asserts that AIN is not a network element within the scope of the 1996 Act, but allows that, if it were, unbundled access to the SMS should meet the requirements of section 251.[1079] BellSouth, however, contends that the Commission should not attempt to declare undefined "software building blocks" to be network elements.[1080] GVNW further argues that such access will require "partitioning" of incumbent LECs' databases to protect each carriers' information.[1081]

473. In our *Intelligent Networks* docket, several parties, including most incumbent LECs, expressed support for the Commission's proposal to require unbundled access to the SMS by third parties.[1082] Several parties argue that such access is technically feasible.[1083] Most incumbent LECs agree that, of the potential points of access to AIN proposed in our *Intelligent Networks* NPRM, access to the SMS poses the least risk of harm to the public switched network.[1084] Many of these commenters argue that access to the SMS would provide competitors with an opportunity to create innovative call processing services.[1085] U S West, however, contends that, since third parties using SMS access would be dependent on incumbent LEC software at the SCE, competitors would not be satisfied with such access because it would not allow them to develop their own proprietary services.[1086] Other parties argue that SMS access

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[1078] Ericsson comments at 6.

[1079] Bell Atlantic comments at 29.

[1080] BellSouth comments at 46.

[1081] GVNW comments at 31.

[1082] *See, e.g.*, BellSouth update comments in CC Docket No. 91-346 at 6; Bell Atlantic comments in CC Docket No. 91-346 at 6; GTE comments in CC Docket No. 91-346 at 21; Central comments in CC Docket No. 91-346 at 12; SNET comments in CC Docket No. 91-346 at 5; NYNEX comments in CC Docket No. 91-346 at 3 n.3, 10-11; Siemens comments in CC Docket No. 91-346 at 2; TIA comments in CC Docket No. 91-346 at 2; MCI comments in CC Docket No. 91-346 at 10; Ericsson reply in CC Docket No. 91-346 at 2-3.

[1083] MCI comments in CC Docket No. 91-346 at 6; Siemens comments in CC Docket No. 91-346 at 2; TIA comments in CC Docket No. 91-346 at 2.

[1084] Bell Atlantic comments in CC Docket No. 91-346 at 6-7; BellSouth comments in CC Docket No. 91-346 at 12, 13; GTE comments in CC Docket No. 91-346 at 19, 21; NYNEX comments in CC Docket No. 91-346 at 3; PacTel comments in CC Docket No. 91-346 at 20-21; SBC comments in CC Docket No. 91-346 at 5, 8; U S West comments in CC Docket No. 91-346 at 52; United and Central comments in CC Docket No. 91-346 at 1.

[1085] GSA comments in CC Docket No. 91-346 at 3; SNET comments in CC Docket No. 91-346 at 2; Siemens comments in CC Docket No. 91-346 at 2; TIA comments in CC Docket No. 91-346 at 2; MCI in CC Docket No. 91-346 comments at 10; Ericsson reply in CC Docket No. 91-346 at 2-3.

[1086] U S West comments in CC Docket No. 91-346 at 53; Ad Hoc Telecommunications Users Committee comments in CC Docket No. 91-346 at 11 (incumbent LECs' ability to mimic third party services created in the incumbent LEC's SCE will diminish the incentive of third parties to create new services that would compete with LEC AIN offerings).